



Methane emissions from the early rice paddy fields of Qingyuan Region in China

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Outline

- ◆ Introduction
- ◆ Experimental design and methods
- ◆ Results and analysis
- ◆ The DNDC model



Introduction

- Methane is one of the most important greenhouse gasses in the atmosphere with its contribution to global warming just lower than CO_2
- Among the manmade sources of methane, rice field is the largest source (Crutzen, 1991)
- Rice area of China accounts for about 22% of total rice area in the world



Experimental design and methods

- The experimental site is located in the village of Longjing of Qingyuan city in the Guangdong province of China
- We use water-sealed mobile chamber to measure methane emission flux
- Samples are analyzed using a gas chromatograph equipped with a flame ionization detector (GC/FID) in the laboratory of Qingyuan Meteorology Bureau

Results and analysis



- The seasonal variation of methane emission flux in this experiment is basic **three-peak mode**.

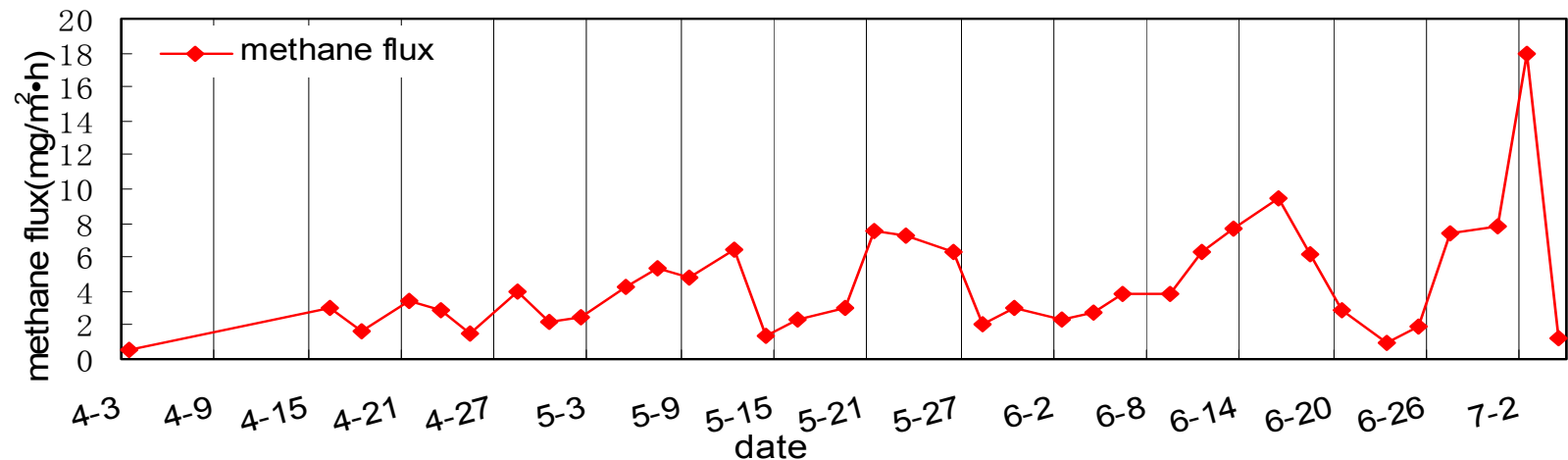


Fig. 2 the seasonal variation of methane emission from the early rice field

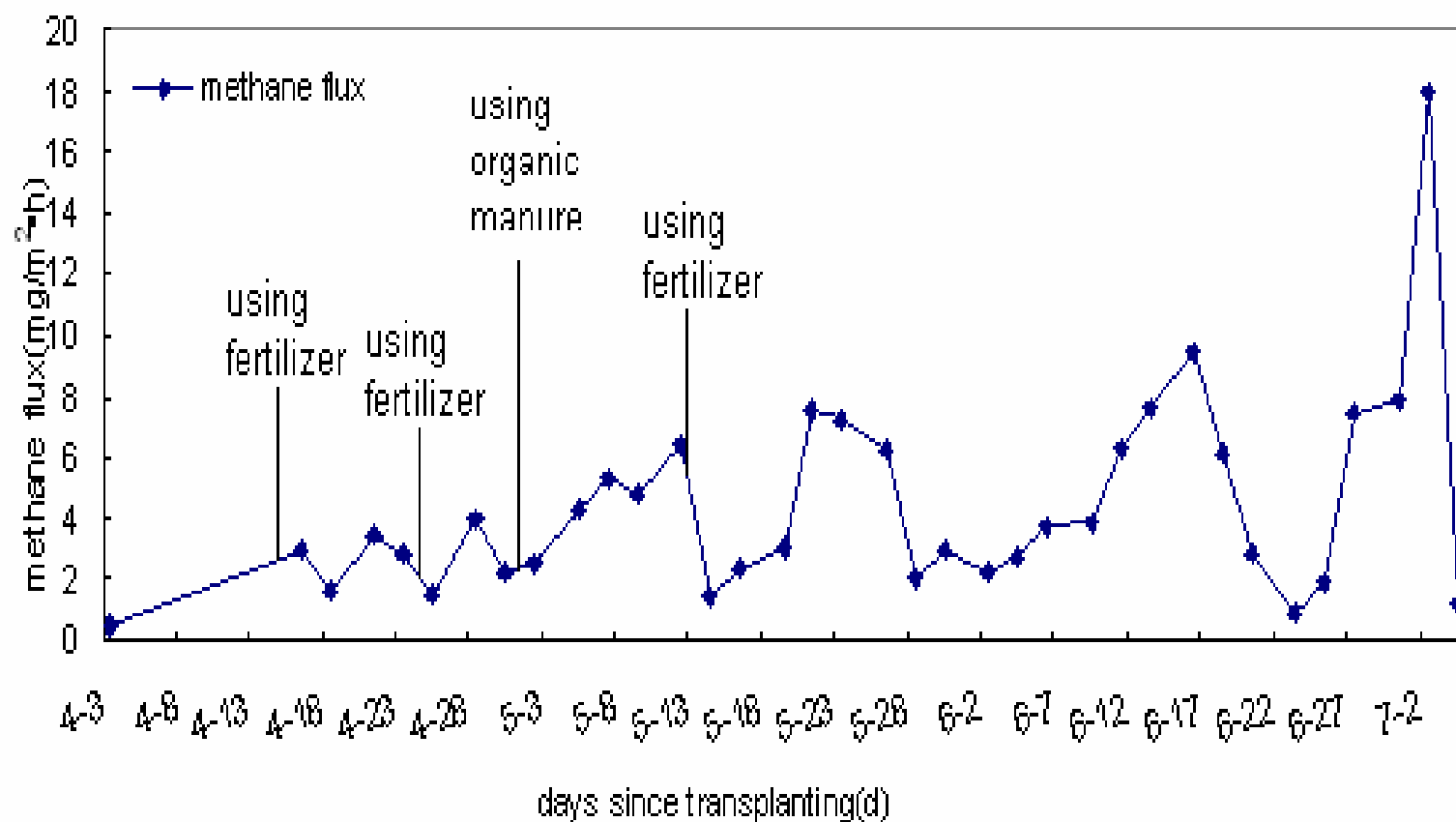


Fig. 3 the record of fertilizing and methane emission flux



- The average methane emission flux of the whole early rice growing season was $4.38\text{mg/m}^2\cdot\text{h}$.



- ◆ When the water level is about 2cm, there is often a corresponding peak of methane flux. We should avoid shallow water level of near 2cm or choose intermittent irrigation in order to decrease methane emission from rice field.

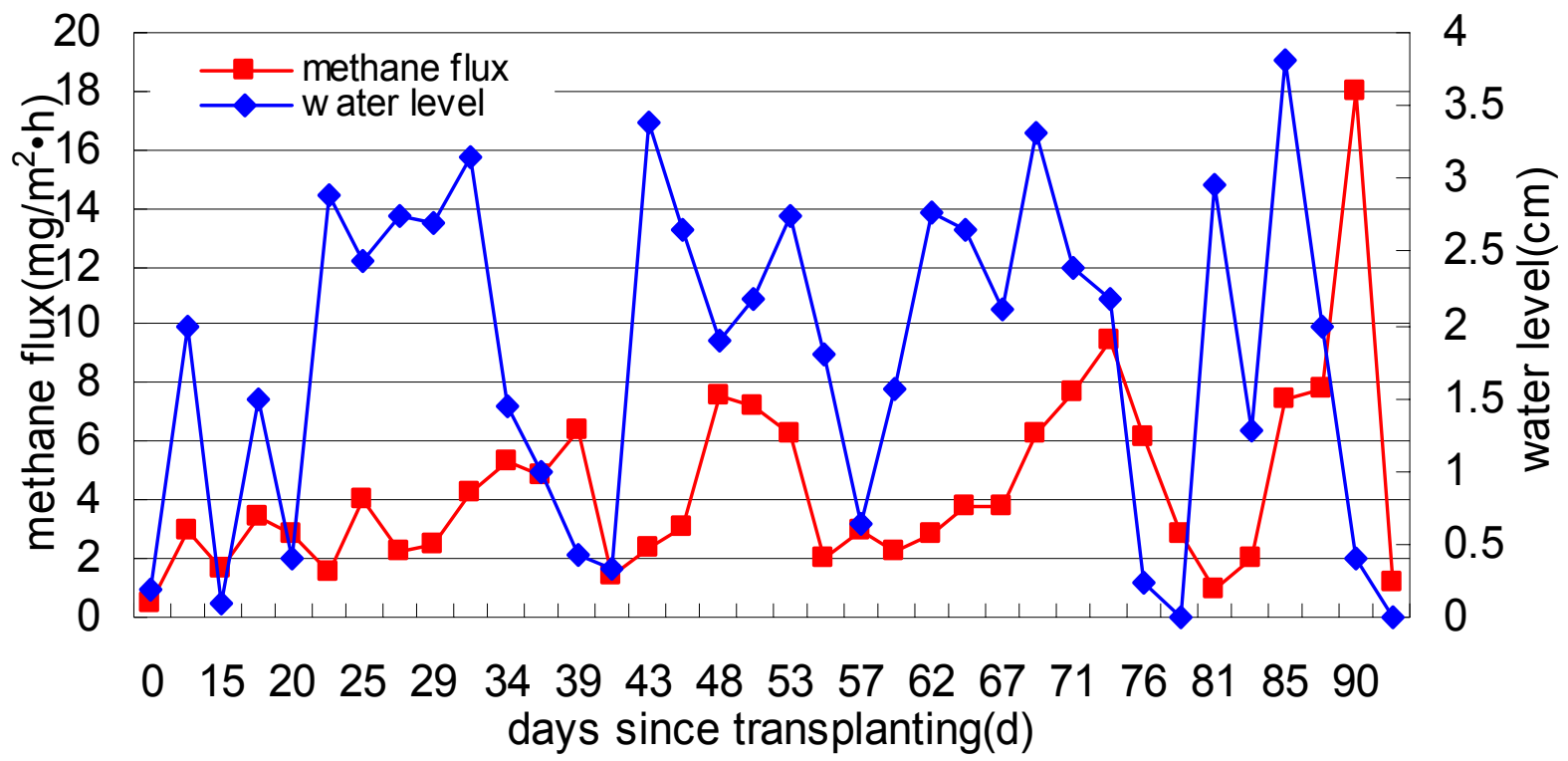


Fig. 4 the relation between methane emission and water level of rice field

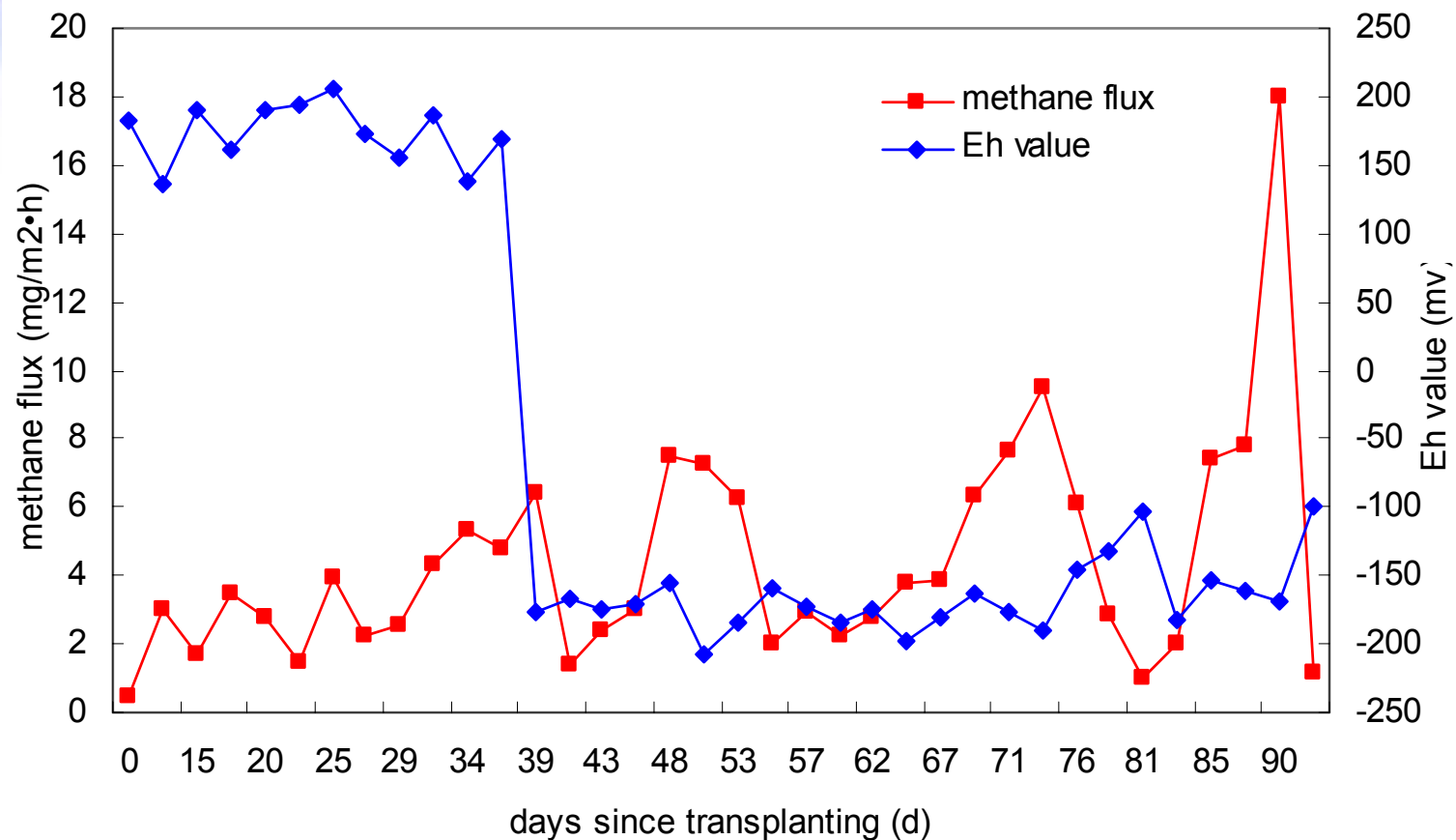


Fig. 5 the relation between methane emission flux from the early rice field and Eh value

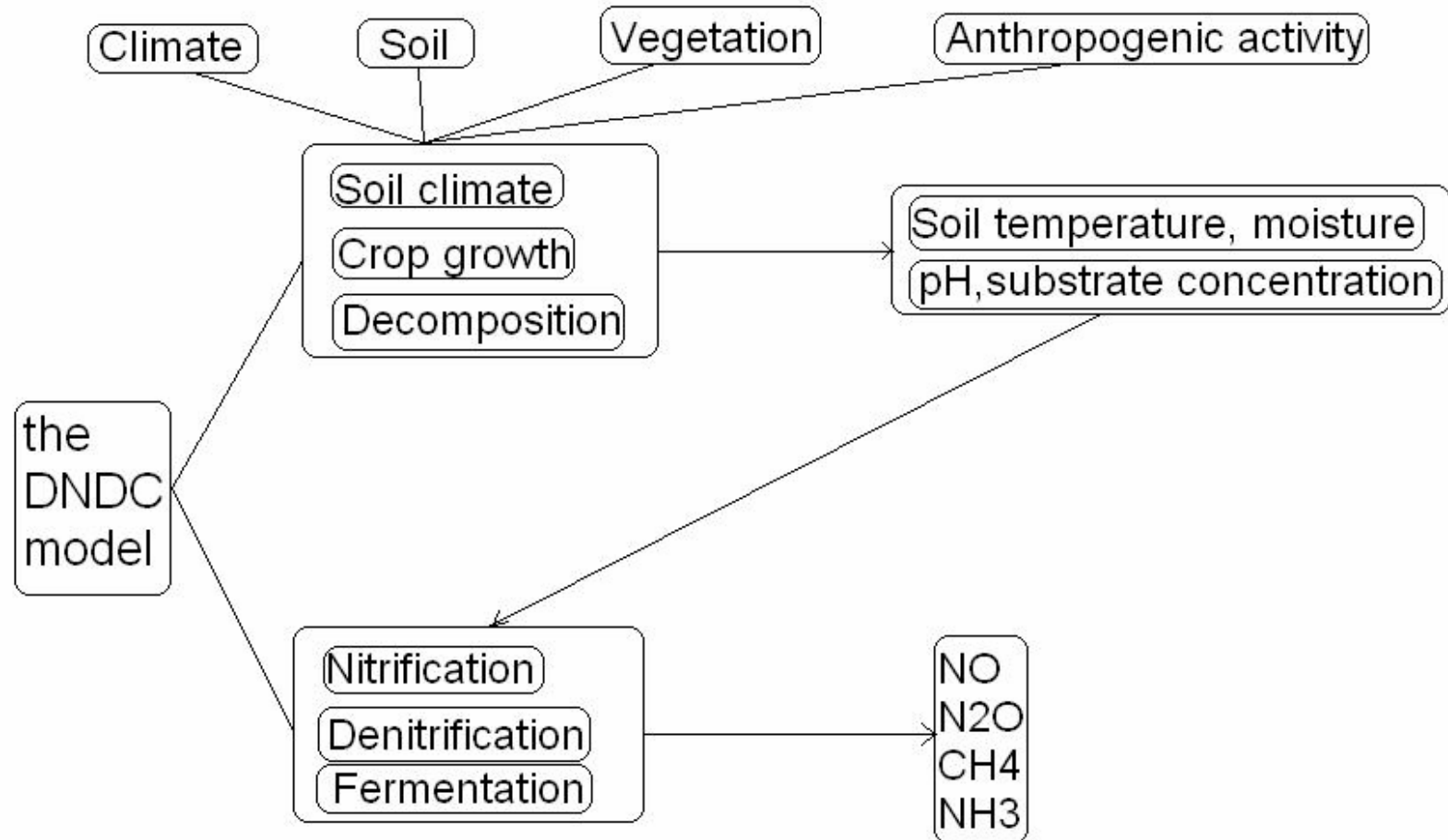
The DNDC model



- The DNDC (denitrification and decomposition) model is developed by the Institute for the Study of Earth, Oceans, and Space (EOS), University of New Hampshire (UNH).
- The DNDC model consists of two components.



The structure of the DNDC model



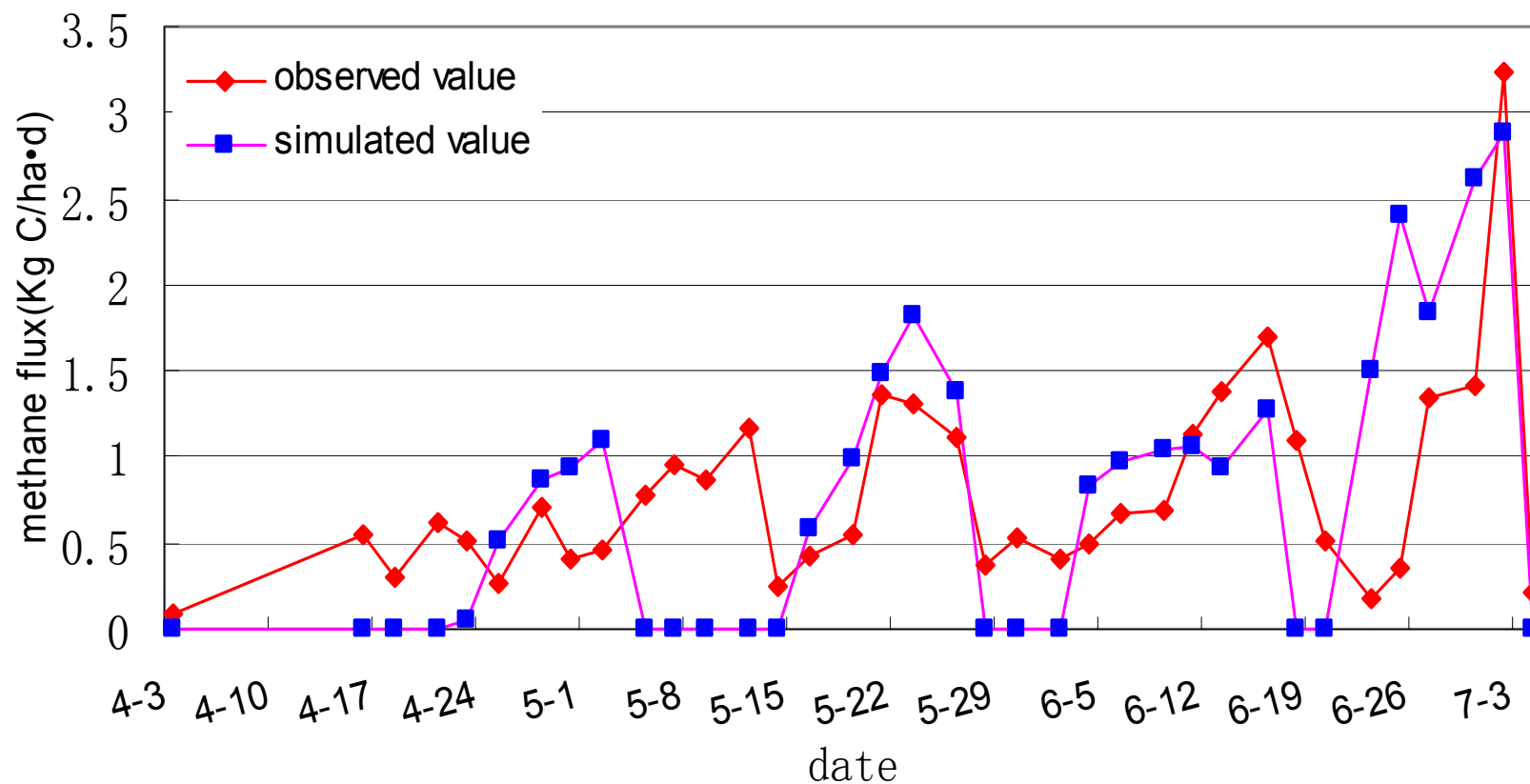


Fig. 6 the compare of the observed value and the simulated value



*The end ,
Thanks!*

清 远 县 政 区 图

比例尺 1 : 40 万

0 4 8 12 公里

清远县在广州市的地理位置



清城镇平面图



图 例

- ★ 县驻地
- 区、镇驻地
- 县界
- 区界
- 铁路
- 公路
- 河流
- 水库
- ▲ 1040 山岭及其高程

回兰为试验田所在地, 清城镇经纬度大致为23°43'N, 113°01'E.

The pictures of collecting samples



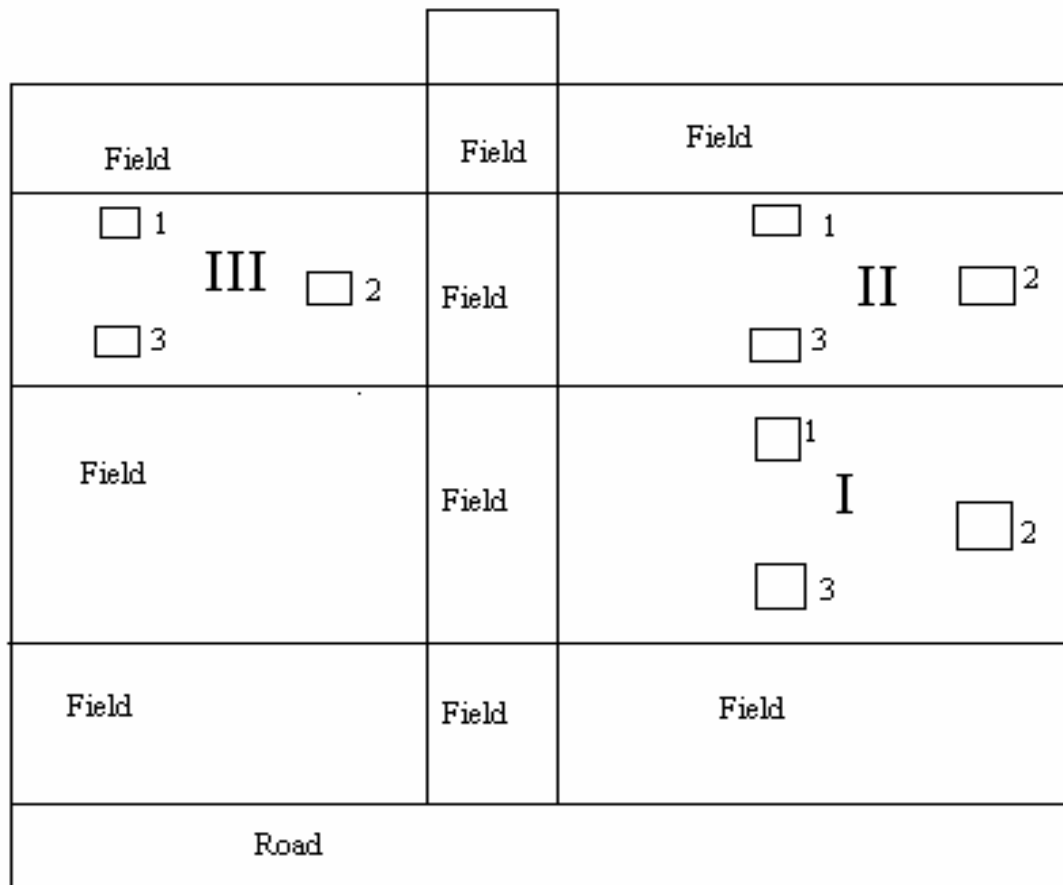
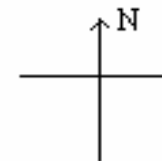


Fig. 1 The map of experimental locations in Qingyuan, Guangdong Province of China

